

AMENDMENTS TO THE CLAIMS

The following claims replace all previous versions and listings of claims in the present patent application.

Listing of Claims

1. (previously presented) Electronic control system for a submarine actuator, said actuator comprising a container body from which a drive shaft projects that is suitable for inserting in a seat of said submarine device, said system comprises an electronic control board for at least one electric motor, arranged inside said container body suitable for moving said drive shaft, said electronic board being suitable for receiving an electrical control signal for said actuator, generated by a remote control station, characterised in that said actuator comprises two electric motors associated with said drive shaft and said electronic control board is suitable for controlling each motor independently from the other.

2. (original) System according to claim 1, further comprising an electronic transducer for detecting the position of such a drive shaft electrically connected with said programmable logic unit.

3. (original) System according to claim 1, wherein said control board comprises a pilot circuit, for said at least one motor, a power supply circuit and a programmable logic unit.

4. (previously presented) System according to claim 1, wherein said electronic control board comprises a first retroaction circuit of the current absorbed by the motor between the programmable logic unit and the pilot circuit and a second pilot circuit of the position signal of the drive shaft between said transducer and said programmable logic unit.

5. (previously presented) System according to claim 4, wherein said control board is suitable for processing the signals coming from the position transducer from a control input and from the pilot circuit, in order to generate an activation signal of said at least one electric motor.

6. (previously presented) System according to claim 5, wherein said processing comprises calculating a speed value and direction for the rotation of the motor, starting from a position value of the drive shaft to be reached and from the current position of the shaft detected by said transducer, and sending a corresponding signal to the pilot circuit of the motor.

7. (previously presented) System according to claim 1, wherein said electronic control board comprises a filtering block of said control signal that compares the value of the signal received with an average of a predetermined number of previous control signals.

8. (previously presented) System according to claim 2, wherein said control board carries out a comparison between the signal received by the transducer and a predetermined number of previous memorised signals corresponding to the limit positions of the movement of the drive shaft, and, from subsequent processing through a linearisation function, determines a decoded position signal.

9. (previously presented) System according to claim 1, wherein said electronic control board is suitable for selecting which electric motor controls the shaft and in the case of an anomaly it is able to switch from one motor to the other.

10. (new) A system, comprising:
a submersible actuator, comprising:
a first electric motor;
a second electric motor; and
a control circuit configured to control the first and second electric motors independently from one another to actuate a submersible flow control mechanism, wherein the control circuit is responsive to a control signal from a remote control station.

11. (new) The system of claim 10, wherein the first and second electric motors are independently drivingly coupled to a drive shaft via a transmission.

12. (new) The system of claim 11, wherein the transmission comprises a transmission shaft, a worm screw coupled to the transmission shaft, and a sprocket coupled to the worm screw and the drive shaft, wherein the first and second electric motors are coupled to the transmission shaft.

13. (new) The system of claim 10, comprising a pressure balancing device coupled to the submersible actuator and configured to balance internal and external pressures.

14. (new) The system of claim 10, comprising the submersible flow control mechanism coupled to the submersible actuator.

15. (new) The system of claim 14, wherein the submersible flow control mechanism comprises a valve, or a pipeline, or a combination thereof.

16. (new) The system of claim 10, comprising a positional detector configured to communicate a position signal indicative of a position of the submersible actuator to the control circuit.

17. (new) A method, comprising:
controlling a first electric motor of a submersible actuator to actuate a submersible flow control mechanism; and
independently controlling a second electric motor of the submersible actuator to actuate the submersible flow control mechanism.

18. (new) The method of claim 17, comprising receiving an electrical control signal from a remote control station, processing the electrical control signal, and triggering at least one of the first and second electric motors to actuate the submersible flow control mechanism.

19. (new) The method of claim 17, wherein controlling and independently controlling comprises selecting either the first electric motor or the second electric motor, and mutually exclusively triggering the selected one of the first or second electric motors to actuate the submersible control mechanism.

20. (new) The method of claim 17, comprising opening or closing flow of a submersible pipeline via the submersible flow control mechanism.